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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Dan T. Moore III

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PEARNE & GORDON LLP

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CLEVELAND, OH 44114-3108

EXAMINER

NGUYEN, TU MINH

ART UNIT

PAPER NUMBER

3748

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/815,063

Applicant(s)

MOORE ET AL.

Examiner

Tu M. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 22-26 and 35-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 27-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 20040331.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restriction

1. Applicant's election of the invention of Group I in an Applicant's Response to an Election/Restriction Requirement submitted on September 11, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 1-21 and 27-34 are readable thereon and will be examined in their full merit. Claims 22-26 and 35-37 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

2. Claim 15 is objected to because on line 2 of the claim, "--with at least one of--" should be inserted following "balance"; and on line 3 of the claim, "and/or" should read "--and--". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 1-7, 18, 19, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Mitchell et al. (U.S. Patent 3,798,903).

Re claims 1-2, as illustrated in Figures 1, 3, and 4, Mitchell et al. disclose an exhaust manifold (22) comprising:

- a ceramic inner layer (30) having an inner wall surface defining an exhaust gas passageway of the manifold (see lines 28-32 of column 2),
- a ceramic insulation layer (28) disposed exterior to and adjacent the inner layer (30) (lines 10-15 of column 3), and
- an outer structural layer (26) disposed exterior to the insulation layer,

wherein the ceramic inner layer (30) is a slip cast layer (lines 34-51 of column 4), and wherein the ceramic insulation layer comprising ceramic fibers and ceramic filler material (see lines 10-15 of column 3).

Re claims 3 and 5, in the exhaust manifold of Mitchell et al., the ceramic inner layer (30) comprises a major amount fused silica (see lines 34-51 of column 4).

Re claims 4 and 6, in the exhaust manifold of Mitchell et al., the ceramic inner layer (30) is slip cast from a slip composition comprising at least 60 weight percent colloidal fused silica particles and no more than 5 weight percent fibers (see lines 34-51 of column 4).

Re claim 7, in the exhaust manifold of Mitchell et al., the ceramic inner layer (30) is made from a ceramic material (colloidal fused silica) having a highly amorphous structure, able to withstand thermal cycling from 25°C up to 800°C and back down to 25°C without cracking (see lines 38-42 of column 4).

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Re claims 18-19, as can be seen in Figures 1, 3, and 4, Mitchell et al. disclose an exhaust manifold (22) comprising a ceramic inner layer (30) having an inner wall surface defining an exhaust gas passageway of the manifold, the ceramic inner layer (30) comprising a major amount of fused silica and being slip cast from a slip composition comprising fused silica and no more than 5 weight percent fibers (lines 34-51 of column 4).

Re claim 32, as shown in Figures 1, 3, and 4, Mitchell et al. disclose an exhaust manifold (22) comprising a ceramic inner layer (30) defining an exhaust gas passageway of the manifold, the ceramic inner layer being made from a material (fused silica) that is highly resistant to thermal shock from thermal cycling of the manifold between ambient temperature and 500°C which is a typical temperature of an exhaust gas exiting a cylinder and entering the manifold (lines 34-51 of column 4).

5. Claims 1, 2, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Haselkorn et al. (U.S. Patent 6,161,379).

Re claims 1-2, as shown in Figures 1-4, Haselkorn et al. disclose an exhaust manifold (18) comprising:

- a ceramic inner layer (6) having an inner wall surface defining an exhaust gas passageway of the manifold,
- a ceramic insulation layer (10) disposed exterior to and adjacent the inner layer, and
- an outer structural layer (16) disposed exterior to the insulation layer,

wherein the ceramic inner layer (6) is a slip cast layer (lines 7-8 of column 5), and

wherein the ceramic insulation layer comprising ceramic fibers (26) and ceramic filler material (28).

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Re claim 9, in the exhaust manifold of Haselkorn et al., the outer structural layer (16) is made from aluminum (line 6 of column 5).

Re claim 10, the exhaust manifold according of Haselkorn et al. further comprises a strain isolation layer (12) disposed between the insulation layer (10) and the outer structural layer (16), wherein the strain isolation layer is a compliant layer effective to dampen unmatched thermal expansion between the outer structural layer and the insulation layer.

6. Claims 1, 8, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Prigent et al. (U.S. Patent 5,386,696).

Re claim 1, as shown in Figures 1-2, Prigent et al. disclose an exhaust manifold (10) comprising:

- a ceramic inner layer (4) having an inner wall surface defining an exhaust gas passageway of the manifold (see lines 47-53 of column 3),
 - a ceramic insulation layer (3) disposed exterior to and adjacent the inner layer (see lines 42-46 of column 3), and
 - an outer structural layer (1) disposed exterior to the insulation layer,
- wherein the ceramic inner layer (4) is a slip cast layer (lines 47-53 of column 3).

Re claim 8, the inner layer (4) in the exhaust manifold of Prigent et al. is 0.05-5 mm thick (lines 17-18 of column 4).

Re claims 27-28, the exhaust manifold of Prigent et al. further comprises a catalyst support body (2) disposed within the exhaust gas passageway of the manifold (line 66 of column 3 to line 2 of column 4), the catalyst support body having a catalyst material (4) disposed on a surface thereof, wherein the catalyst material being selected from the group

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consisting of: a) palladium-containing catalyst materials; b) platinum-containing catalyst materials; c) perovskite catalysts having the form ABO_x where A is a rare earth element or an alkaline earth element, and B is a transition metal element; and d) fluorite catalysts having the form ABO_x where A is a rare earth element and B is Ce or Zr.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. as applied to claim 1 above, in view of Rudert et al. (U.S. Patent 4,205,527).

The exhaust manifold of Mitchell et al. discloses the invention as cited above, however, fails to disclose that the manifold is water-cooled.

As shown in Figure 1, Rudert et al. disclose an exhaust manifold. Rudert et al. teach that it is conventional in the art to include water passage within a wall of the manifold to reduce a change in wall temperature of the manifold. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Rudert et al. in the manifold of Mitchell et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to reduce stress and strain in a manifold wall due to thermal shock.

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9. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. as applied to claim 18 above, in view of legal precedent.

The exhaust manifold of Mitchell et al. discloses the invention as cited above, however, fails to disclose that the inner wall surface having a surface grain roughness less than 10 μm .

Mitchell et al. disclose the claimed invention except for specifying an optimum value of a surface grain roughness less than 10 μm for the inner wall surface. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum value of surface grain roughness for the inner wall surface, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

10. Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. as applied to claim 18 above, in view of Prigent et al.

Re claim 30, the exhaust manifold of Mitchell et al. discloses the invention as cited above, however, fail to disclose that the manifold further comprises a catalyst support body disposed within the exhaust gas passageway of the manifold, the catalyst support body having a catalyst material disposed on a surface thereof.

As shown in Figures 1-2, Prigent et al. disclose an exhaust manifold with catalytic wall for internal combustion engines. Prigent et al. teach that it is conventional in the art to include in the manifold (10) a catalyst support body (2) disposed within the exhaust gas passageway of the manifold, the catalyst support body having a catalyst material (4) disposed on a surface thereof. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Prigent et al. in the manifold of Mitchell et

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al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively remove harmful emissions in an exhaust gas stream.

Re claim 31, the modified exhaust manifold of Mitchell et al. further comprises a damping layer ((28) in Mitchell et al. or (3) in Prigent et al.) disposed between the catalyst support body and the inner wall surface of the ceramic inner layer, the damping layer being effective to compensate for or dampen unmatched thermal expansion characteristics between the outer structural layer and the catalyst support body.

11. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haselkorn et al. as applied to claim 10 above, in view of Foster et al. (U.S. Patent 6,732,432).

Re claim 11, the exhaust manifold of Haselkorn et al. discloses the invention as cited above, however, fails to disclose that the strain isolation layer is an intumescent mat.

As shown in Figure 1, Foster et al. disclose an exhaust emission control device (10). As illustrated in Figure 2, Foster et al. teach that it is conventional in the art to utilize a strain isolation layer (16) comprising an intumescent mat adjacent to a catalyst layer (14) so that the isolation layer is adapted to hold the catalyst layer and to insulate it from shock and vibration (see lines 59-64 of column 2 and lines 1-24 of column 3). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Foster et al. in the manifold of Haselkorn et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art.

Re claims 12, 13, 14, and 16, in the modified exhaust manifold of Haselkorn et al., the intumescent mat comprising an expandable material that expands on heating and contracts on cooling (see lines 1-11 of column 3 in Foster et al.), wherein the expandable material being in

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the form of embedded particles of vermiculite, perlite, or a combination thereof, dispersed throughout the intumescent mat.

Re claim 15, in the modified exhaust manifold of Haselkorn et al., the expandable material is vermiculate, perlite or a combination thereof (see lines 1-11 of column 3 in Foster et al.). Haselkorn et al., however, fail to disclose that the intumescent mat comprising, by weight, 20-60 percent ceramic fibers, 35-75 percent expandable material, balance with at least one of ceramic filler and binder material.

Haselkorn et al. disclose the claimed invention except for specifying an optimum composition range of the intumescent mat comprising, by weight, 20-60 percent ceramic fibers, 35-75 percent expandable material, balance with at least one of ceramic filler and binder material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum composition range of the intumescent mat, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

12. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prigent et al. as applied to claim 1 above, in view of official notice.

The exhaust manifold of Prigent et al. discloses the invention as cited above, however, fails to disclose that the catalyst is effective to convert at least a portion of CO and NO_x in an exhaust gas flowing through the exhaust gas passageway to CO₂ and N₂ and O₂, respectively.

It is well known to those with ordinary skill in the art that the noble metals utilized by Prigent et al. as a catalyst in the ceramic inner layer are effective to oxidize CO to CO₂ and

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reduce NO_x in an exhaust gas stream to N₂ and water. Therefore, such disclosure by Prigent et al. is notoriously well known in the art so as to be proper for official notice.

13. Claims 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prigent et al. (U.S. Patent 5,386,696) in view of official notice.

Re claim 33, as shown in Figures 1-2, Prigent et al. disclose an exhaust manifold (10) comprising a ceramic inner layer (4) defining an exhaust gas passageway of the manifold (see lines 47-53 of column 3), the ceramic inner layer comprising a catalyst (line 66 of column 3 to line 2 of column 4).

Prigent et al., however, fail to specifically disclose that the catalyst is effective to convert at least a portion of CO and NO_x in an exhaust gas flowing through the exhaust gas passageway to CO₂ and N₂ and O₂, respectively.

It is well known to those with ordinary skill in the art that the noble metals utilized by Prigent et al. as a catalyst in the ceramic inner layer are effective to oxidize CO to CO₂ and reduce NO_x in an exhaust gas stream to N₂ and water. Therefore, such disclosure by Prigent et al. is notoriously well known in the art so as to be proper for official notice.

Re claim 34, the exhaust manifold of Prigent et al. further comprises a ceramic insulation layer (3) (see lines 42-46 of column 3) disposed exterior to and adjacent the inner layer, and an outer structural layer (1) disposed exterior to the insulation layer.

Prior Art

14. The IDS (PTO-1449) filed on March 31, 2004 has been considered. An initialized copy is attached hereto.

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15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of four patents: Kruger (U.S. Patent 6,555,070), Chen et al. (U.S. Patent 6,598,389), Sugaya et al. (U.S. Patent 6,625,979), and Mathew (U.S. Patent 6,933,056) further disclose a state of the art.

Communication


16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

October 1, 2006



Tu M. Nguyen

Primary Examiner

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